



MATERIAL SAFETY DATA SHEET

**SIMAZINE 4L
FLOWABLE
HERBICIDE**

SECTION I — IDENTIFICATION OF PRODUCT

MANUFACTURER'S NAME:

Platte Chemical Co.
150 South Main Street Fremont, Nebraska 68025

EMERGENCY TELEPHONE NO.:

(303) 358-4400 or CHEMTREC (800) 424-9300

TRADE NAME AND SYNONYMS:

CLEAN CROP SIMAZINE 4L FLOWABLE HERBICIDE

CHEMICAL NAME AND SYNONYMS: Simazine; 2-chloro-4,6-bis(ethylamino)-s-triazine

CHEMICAL FAMILY: Triazine Herbicide

SARA TITLE III HAZARD CATEGORY:

IMMEDIATE Y
DELAYED N

FIRE N
REACTIVE N

SUDDEN RELEASE OF
PRESSURE N

SECTION II — HAZARDOUS INGREDIENTS OF MIXTURES

COMPONENT:	%	THRESHOLD LIMIT VALUE (Units):
Simazine (CAS: 122-34-9)	42.8	None established
Inert Ingredients	57.2	—

THIS PRODUCT CONTAINS THE FOLLOWING SUBSTANCES WHICH ARE REGULATED UNDER SARA, TITLE III, SECT. 313:
None

SECTION III — PHYSICAL DATA

APPEARANCE AND ODOR: Off-white to light brown flowable suspension with virtually no odor

BOILING POINT (*F): >200°F (water)

SPECIFIC GRAVITY (WATER = 1): 1.103-1.105

DENSITY: 9.2 lbs./gal.

VAPOR PRESSURE (MM. OF MERCURY): 10.3 (Reid ASTM D323)

PERCENT VOLATILE (BY VOLUME): Not available approx. 45%
(water)

VAPOR DENSITY (AIR = 1): 0.011 (HCR TM007)

EVAPORATION RATE (BUTYL ACETATE = 1): Not available
(water)

SOLUBILITY IN WATER: Disperses with minimal agitation

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (SPECIFY METHOD/*F): Does not flash; not applicable.

FLAMMABLE LIMITS (PERCENT BY VOLUME): Not applicable.

FIRE EXTINGUISHING MEDIA: Considered non-combustible; use medium appropriate to surrounding fire. Dry Chemical, CO₂, Foam, Water spray or fog.

SPECIAL FIRE FIGHTING PROCEDURES: Smoke and fumes from fire may contain hazardous components. Use self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: If water is used to fight fire or cool containers, contain run-off by diking to prevent contamination of water supplies.

SECTION V — REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: Excessive heat.

INCOMPATIBILITY (Materials to avoid): Not known.

HAZARDOUS DECOMPOSITION PRODUCTS: Not known. Oxides of nitrogen, chlorine-containing compounds and other unknown hazardous materials may be formed in a fire situation. Incomplete combustion may lead to formation of carbon monoxide and/or other asphyxiants.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: None known.

READ THE BACK.

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MSDS: SIMAZINE 4L FLOWABLE HERBICIDE

SECTION VI — HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

Routes of Entry: Ingestion, inhalation, eyes and skin contact. **Most Likely Route of Entry:** Dermal. Product is considered to be of low to moderate toxicity. May be harmful if swallowed or inhaled. May cause irritation of eyes, nasal passages, throat and skin.
For Simazine: Acute Oral LD₅₀ (rat): 971 mg/kg

EMERGENCY AND FIRST AID PROCEDURES: Call a physician immediately in all cases of suspected poisoning.

Ingestion: Drink 1 or 2 glasses of water and induce vomiting. Never induce vomiting or give anything by mouth to an unconscious person. Keep head lower than chest to avoid aspiration into lungs. Call physician immediately.

Eyes: Flush with running water for at least 15 minutes while holding eyelids open. If irritation persists, get medical attention.

Skin: Remove all contaminated clothing. Wash skin and hair thoroughly with soap and water. Wash clothing before reuse. If irritation persists, get medical attention.

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen; if breathing stops administer artificial respiration. Get medical attention immediately.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

None known. Preexisting skin or respiratory disorders may be aggravated by excessive exposure to this material.

POTENTIAL CARCINOGEN STATUS:

Not known. None of the components in this product is listed by IARC, NTP or OSHA as a potential carcinogen.

SECTION VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Contain spill; absorb liquids by covering with clay or other absorbent material; then vacuum or scoop and sweep up wastes and place in container for disposal.

WASTE DISPOSAL METHOD:

Material which cannot be used at the site should be disposed of in an approved waste disposal facility following all applicable Federal, State and Local regulations. Triple rinse empty containers and offer for recycling or reconditioning, or puncture and dispose of in an approved sanitary landfill. Do not contaminate water supplies by disposal of wastes or containers.

SECTION VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Not normally required. If vapors may exceed acceptable levels, wear MSHA/NIOSH-approved respirator or mask to protect against pesticide dusts, mists and vapors.

VENTILATION:

LOCAL EXHAUST: Not normally required.

SPECIAL: Not normally required.

MECHANICAL (General): Not normally required.

OTHER: Work in a well-ventilated area.

PROTECTIVE GLOVES: Rubber or impervious gloves recommended.

EYE PROTECTION: Chemical goggles or shielded safety glasses recommended.

OTHER PROTECTIVE EQUIPMENT: Wear clothing consistent with good practices for handling and applying pesticides. Wear protective clothing, including long pants, long-sleeved shirt, hat and rubber boots during mixing and loading operations and during application. Wash used clothing before reuse.

SECTION IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Store in a cool, dry place away from children, domestic animals, food and feed products, seed and fertilizer. Do not contaminate other stored products or the storage area by handling or storage of this product. Immediately clean up any spills which occur during handling and storage. Protect from freezing.

OTHER PRECAUTIONS:

Do not contaminate water supplies by handling or storage of product, cleaning of equipment or disposal of wastes. Keep work and storage areas clean. Toxic to fish and other aquatic organisms. Read and follow precautionary measures on product label.

SECTION X — DOT INFORMATION AND DATE

DOT SHIPPING DESCRIPTION: Not regulated by DOT **DOT LABEL:** None **DATE OF ISSUE:** 11/22/89 **SUPERSEDES:** 10/12/88

All information contained in this Material Safety Data Sheet is furnished free of charge and is intended for your evaluation. In our opinion the information is, as of the date of this Material Safety Data Sheet, reliable, however, it is your responsibility to determine the suitability of the information for your use. You are advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional or variable conditions or circumstances exist or because of applicable laws or government regulations. Therefore, you should use this information only as a supplement to other information gathered by you, and you must make independent determinations of the suitability and completeness of the information from all sources to assure both proper use of the material described herein and the safety and health of employees. Accordingly, no guarantee expressed or implied is made by Platte Chemical Co. as to the results to be obtained based upon your use of the information, nor does Platte Chemical Co. assume any liability arising out of your use of the information.



Material Safety Data Sheet

MEC AMINE-D

SECTION I — IDENTIFICATION OF PRODUCT

MANUFACTURER'S NAME	Platte Chemical Co., Inc.	EMERGENCY TELEPHONE NO. (303) 338-4400 or CHEMTREC (800) 424-9300
ADDRESS	150 South Main Street Fremont, Nebraska 68025	
TRADE NAME AND SYNONYMS	CLEAN CROP MEC AMINE-D	
CHEMICAL NAME AND SYNONYMS	2,4-D amine: 2,4-Dichlorophenoxyacetic acid, dimethylamine salt, MCPP Dimethylamine; 2,4-methyl-4-chlorophenoxypropionic acid, dimethylamine salt, Dicamba, Dimethylamine; (3,5-Dichloro-o-oxisic acid, dimethylamine salt)	
CHEMICAL FAMILY	Phenoxy herbicide mixture	

SECTION II — HAZARDOUS INGREDIENTS OF MIXTURES

COMPONENT	%	HEALTH HAZARD (ACUTE) (LD50)
Dimethylamine salt of 2,4-D (CAS: 2008-39-1)	30.56	ACUTELY TOXIC: 15mg/kg (for Acid)
Dimethylamine salt of MCPP (CAS: 13791-92-9)	16.34	MCPP & OSHA REG. 15mg/kg (Acid)
Dimethylamine salt of Dicamba (for acid: CAS: 1918-00-9)	2.77	None established
Inert Ingredients (Not Hazardous)	50.33	None established

SECTION III — PHYSICAL DATA

APPEARANCE AND ODOR	Clear, light amber-colored liquid with typical phenoxy herbicide odor.		
BOILING POINT (DEGREES FAHRENHEIT)	212°F (100°C)	SPECIFIC GRAVITY (WATER = 1)	1.13
		DENSITY	9.42 lbs./gal.
VAPOR PRESSURE (MM. OF MERCURY)	approx. 21 mmHg (Reid-ASTM D323)	PERCENT VOLATILE (BY VOLUME)	> 50% (water)
VAPOR DENSITY (AIR = 1)	approx. 0.021 (Hauser HCR TM007)	EVAPORATION RATE (W/TL ACETATE = 1)	Not available Lower than Butyl Acetate
SOLUBILITY IN WATER	Miscible in water		

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (SPECIFY METHOD/DEGREES FAHRENHEIT)	Does not flash. Not applicable.	FLAMMABLE LIMITS (PERCENT BY VOLUME)	LOWER UPPER
			— Not applicable —
FIRE EXTINGUISHING MEDIA	Considered non-combustible; use medium appropriate to surrounding fire. Dry Chemical, Foam, CO ₂ , Water spray or fog.		
SPECIAL FIRE FIGHTING PROCEDURES	Smoke and fumes from fire may contain hazardous components. Use self-contained breathing apparatus and full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	If water is used to fight fire or cool containers, contain run-off by diking to prevent contamination of water supplies.		

SECTION V — REACTIVITY DATA

STABILITY	UNSTABLE	CONDITIONS TO AVOID
	STABLE	Excessive heat.
INCOMPATIBILITY (Materials to avoid)	Strong oxidizers, acids.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Hydrogen Chloride (HCl), other chlorine-containing compounds, oxides of nitrogen and other unknown hazardous materials may be formed in a fire situation. Incomplete combustion may lead to formation of carbon monoxide and/or other asphyxiants.	
HAZARDOUS POLYMERIZATION	MAY OCCUR	CONDITIONS TO AVOID
	WILL NOT OCCUR	None known.

READ THE BACK.

Material Safety Data Sheet

DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

Product Code: 01662

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

1. INGREDIENTS: (% w/w, unless otherwise noted)

2,4-Dichlorophenoxyacetic acid, butoxyethyl ester	CAS# 001929-73-3	34.4%
3,5,6-Trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester	CAS# 064700-56-7	16.5%
Other ingredients, including:		49.1%
Kerosene	CAS# 008008-20-6	
Proprietary surfactants		

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: >175C (kerosene)
VAP PRESS: 0.1mm @37.8C (kerosene)
VAP DENSITY: 4.7 (kerosene)
SOL. IN WATER: Forms an emulsion
SP. GRAVITY: 1.013 @ 20C/20C
APPEARANCE: Reddish brown liquid.
ODOR: Sweet odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 148F, 64.4C
METHOD USED: Setaflash

FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Water fog, foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Noxious fumes under fire conditions.
Contain water from fire fighting to prevent entry to water supplies.

FIRE-FIGHTING EQUIPMENT: Use positive pressure self-contained

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Avoid temperatures above or near flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Acid, base and oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Noxious fumes, nitrogen oxide, hydrogen chloride and phosgene may result under fire conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Use appropriate safety equipment. Dike large spills. Absorb spills with inert dry material such as sand or sawdust. Do not use water for cleanup.

DISPOSAL METHOD: If wastes cannot be disposed of by use according to label instructions, contact your state pesticide or Environmental Control Agency or the hazardous waste representative at the nearest EPA regional office for guidance.

6. HEALTH HAZARD DATA:

EYE: May cause moderate eye irritation. Corneal injury is unlikely.

SKIN CONTACT: Prolonged exposure may cause skin irritation. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated skin exposure may result in absorption of harmful amounts. The LD50 for skin absorption in rabbits is >2000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 for male rats is 2589 mg/kg and for female rats is 2398 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury, swallowing amounts larger than that may cause injury. If aspirated (liquid

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DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

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MSDS:001715

6. HEALTH HAZARD DATA: (CONTINUED)

enters the lung), may cause lung damage or even death due to chemical pneumonia.

INHALATION: Excessive exposure may cause irritation to upper respiratory tract. Signs and symptoms of excessive exposure may be central nervous system effects. The LC50 for male rats is approximately 5 mg/L and >5 mg/L for females.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may cause liver, kidney, blood, gastrointestinal, muscular and respiratory effects.

CANCER INFORMATION: Triclopyr did not cause cancer in long-term animal studies. Various animal cancer tests have shown no reliably positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative. (2,4-D)

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.

REPRODUCTIVE EFFECTS. In animal studies, triclopyr has been shown not to interfere with reproduction. Excessive dietary levels of 2,4-D caused toxic effects (weight and viability reduction) to the offspring in a rat reproduction study.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in vitro ('test tube') mutagenicity tests have been inconclusive. Results of mutagenicity tests in animals have been inconclusive.

7. FIRST AID:

EYES: Flush immediately with plenty of water. Get medical attention if irritation persists.

SKIN: Wash off in flowing water or shower. Get medical attention if irritation persists.

INGESTION: Do not induce vomiting. Call a physician or Poison Control Center.

INHALATION: Remove to fresh air if effects occur. Consult a

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

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7. FIRST AID: (CONTINUED)

physician.

NOTE TO PHYSICIAN: The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): 3,5,6-Trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester: the Dow Industrial Hygiene Guide is 2 mg/m³ as the acid equivalent, skin. Kerosene: the Dow Industrial Hygiene Guide is 10 mg/m³. ACGIH TLV and OSHA PEL are 10 mg/m³ for 2,4-D acid.

VENTILATION: Good general ventilation should be sufficient for most conditions.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact could occur.

EYE PROTECTION: Use safety glasses. Where contact with this material is likely, chemical goggles are recommended because eye contact may cause discomfort even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: See label. Keep out of reach of children. Avoid eye or skin contact. Provide eye fountain and washing facilities near work area. Do not store near fertilizer, seeds, insecticides and fungicides. Keep away from open flame.

MSDS STATUS: Sections 6,7,8 and regsheets Revised 8/92

For information regarding state/provincial and federal regulations see the Regulatory Information Section.

(R) Indicates a Trademark Of DowElanco

DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

REGULATORY INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U.S. REGULATIONS

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

OSHA HAZARD COMMUNICATION STANDARD:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

(R) Indicates a Trademark of DowElanco
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult DowElanco For Further Information.

MONSANTO MATERIAL SAFETY DATA

MONSANTO PRODUCT NAME
ROUNDUP® HERBICIDE

MONSANTO COMPANY
800 N. LINDBERGH
ST. LOUIS, MO. 63167
EMERGENCY PH. NO. (CALL COLLECT) (314) 694-4000
DATE PREPARED: November, 1992

PRODUCT IDENTIFICATION

EPA Registration Number: 524-445
Synonyms: None
Chemical Name: Not Applicable, Formulated Product
Active Ingredient: *Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt 41.0%
Inert Ingredients: 59.0%
100.0%
*Contains 480 grams per liter or 4 pounds per gallon of the active ingredient glyphosate in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.
CAS Reg. No.: Not Applicable, Formulated Product
CAS Reg. No. Active Ingredient: 1071-83-6
DOT Proper Shipping Name: Not Applicable
DOT Hazard Class/I.D. No.: Not Applicable
DOT Label: Not Applicable
Reportable Quantity (RQ) Under CERCLA: Not Applicable
U.S. Surface Freight Classification: Weed killing compound, N.O.I.B.N.

SARA Hazard Notification

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s): Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:

This product contains, as components, the substances listed below which are identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):
Ethoxylated Tallowamines, CAS Reg. No. 61791-26-2

WARNING STATEMENTS

Keep out of reach of children.

WARNING!

CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY

HARMFUL IF INHALED.

REFORMULATION IS PROHIBITED

SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS

PRECAUTIONARY MEASURES

- Do not get in eyes or breathe spray mist or get in or on clothing.
- Wear goggles, face shield or safety glasses.
- Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.
- Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.
- Do not contaminate water when disposing of equipment washwaters.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

- If In Eyes:** Hold eyelids open and flush with plenty of water. Get medical attention.
- If Swallowed:** Drink promptly a large quantity of milk, egg whites, or gelatin solution. If these are not available, drink large quantities of water. Get medical attention.
- If Inhaled:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.
- NOTE:** For additional human emergency first aid or treatment guidance, call collect, anytime, day or night (314) 694-4000.

OCCUPATIONAL CONTROL PROCEDURES

- Eye Protection:** Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted ROUNDUP® herbicide is likely to occur.
- Skin Protection:** ROUNDUP® herbicide does not present significant skin concern requiring special protection.
- Respiratory Protection:** For Handling of the Undiluted Product: Undiluted ROUNDUP® herbicide is not likely to present an airborne exposure concern during normal handling. In the event of an accidental discharge of the material during manufacture or handling which produces a heavy vapor or mist, workers should put on respiratory protection equipment. Consult respirator manufacturer to determine appropriate type of equipment. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer.
- For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use - dilutions of ROUNDUP® herbicide.
- Ventilation:** No special precautions are recommended.
- Airborne Exposure Limits:**
- | | |
|-----------------|---|
| Product: | ROUNDUP® herbicide - 100% by wt.: |
| | OSHA PEL: None established ACGIH TLV: None established |
| | Ethoxylated Tallowamine: |
| | OSHA PEL: None established ACGIH TLV: None established |

FIRE PROTECTION INFORMATION

- Flash Point:** >200°F **Method:** Pensky-Martens
- Extinguishing Media:** Water spray, foam, dry chemical, CO₂, or any class B extinguishing agent.
- Special Firefighting Procedures:** Firefighters or others who may be exposed to vapors, mists or products of combustion should wear a self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.
- Unusual Fire and Explosion Hazards:** None

REACTIVITY DATA

- Stability:** Stable for at least 5 years under normal conditions of warehouse storage.
- Incompatibility:** Spray solutions of this product should be mixed, stored or applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined containers.
- DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.
- Hazardous Decomposition Products:** None
- Hazardous Polymerization:** Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.

HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of ROUNDUP® herbicide and development of Precautionary Statements and Occupational Control Procedures recommended in this document.

EFFECTS OF EXPOSURE

Skin contact and inhalation are expected to be the primary routes of occupational exposure to ROUNDUP® herbicide. Although limited occupational exposure to this material has not been reported to produce significant adverse health effects, ROUNDUP® herbicide is considered, on the basis of single exposure (acute) animal tests, to be slightly to moderately irritating to eyes. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.

TOXICOLOGICAL DATA

Data from laboratory studies conducted by Monsanto with ROUNDUP® herbicide are summarized below:

Single exposure (acute) studies indicate:

Oral -	Practically non-toxic, (Rat LD ₅₀ , >5,000 mg/Kg)
Dermal -	Practically non-toxic, (Rabbit LD ₅₀ , >5000 mg/Kg)
Inhalation -	Slightly toxic, (Rat 4-hr LC ₅₀ , ~2.6 mg/L)
Eye Irritation -	Slightly to moderately irritating, (Rabbit)
Skin Irritation -	Essentially non-irritating (Rabbit, 4 hr. exposure)

No skin allergy was observed in guinea pigs following repeated skin exposure.

COMPONENTS

Data from laboratory studies conducted by Monsanto and from the scientific literature on components of ROUNDUP® herbicide:

Isopropylamine Salt of Glyphosate

Data from studies with a formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight body weight changes. Following repeated skin exposure (3-week) to MON 0139, skin irritation was the primary effect in rabbits.

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice at high dose levels. Reduced body weight gain and eye changes were observed at the high dose level in one long-term (2 year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. Based on the results from the chronic studies, EPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

Nonoxylated Fatty Amine

The surfactant component of ROUNDUP® herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

PHYSICAL DATA

Appearance:	clear, viscous amber-colored solution
Odor:	practically odorless to slight amine-like odor
pH:	4.7 (1% solution)
Specific Gravity:	1.17 (Water = 1)

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

SPILL/LEAK:

Observe all protection and safety precautions when cleaning up spills -- see Occupational Control Procedures.

Liquid spills on floor or other impervious surfaces should be contained or diked, and should be absorbed with attapulgite, bentonite or other absorbent clays. Collect contaminated absorbent, place in plastic-lined metal drum and dispose of in accordance with instructions provided under DISPOSAL. Thoroughly scrub floor with a strong industrial type detergent solution and rinse with water.

Liquid spills that soak into the ground should be dug-up, placed in plastic-lined metal drums and disposed of in accordance with instructions provided under DISPOSAL.

Leaking containers should be separated from non-leakers and either the container or its contents transferred to a plastic-lined drum or other non-leaking container. Dispose of leaking container in accordance with instructions provided under DISPOSAL. Any recovered spilled liquid should be similarly collected and disposed of.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

DISPOSAL:

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.**

Metal Drums: Triple rinse container. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Metal Bulk: Triple rinse emptied bulk containers. Then offer for recycling or reconditioning or disposal in a manner approved by state and local authorities.

Plastic Drums and mini bulk: Do not reuse container. Return container per the Monsanto container return program. If not returned, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed, by state and local authorities, by burning. If burned, stay out of smoke.

DATE: November, 1992

SUPERSEDES: February, 1992

MSDS NO.: S00012114
(previously M00007588)

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CALL: 1-800-332-3111

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Material Safety Data Sheet

DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

Product Code: 01662

Page: 1

Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

1. INGREDIENTS: (% w/w, unless otherwise noted)

2,4-Dichlorophenoxyacetic acid, butoxyethyl ester	CAS# 001929-73-3	34.4%
3,5,6-Trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester	CAS# 064700-56-7	16.5%
Other ingredients, including:		49.1%
Kerosene	CAS# 008008-20-6	
Proprietary surfactants		

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: >175C (kerosene)
VAP PRESS: 0.1mm @37.8C (kerosene)
VAP DENSITY: 4.7 (kerosene)
SOL. IN WATER: Forms an emulsion
SP. GRAVITY: 1.013 @ 20C/20C
APPEARANCE: Reddish brown liquid.
ODOR: Sweet odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 148F, 64.4C
METHOD USED: Setaflash

FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Water fog, foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Noxious fumes under fire conditions.
Contain water from fire fighting to prevent entry to water supplies.

FIRE-FIGHTING EQUIPMENT: Use positive pressure self-contained

(Continued on page 2)



Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Avoid temperatures above or near flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Acid, base and oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Noxious fumes, nitrogen oxide, hydrogen chloride and phosgene may result under fire conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Use appropriate safety equipment. Dike large spills. Absorb spills with inert dry material such as sand or sawdust. Do not use water for cleanup.

DISPOSAL METHOD: If wastes cannot be disposed of by use according to label instructions, contact your state pesticide or Environmental Control Agency or the hazardous waste representative at the nearest EPA regional office for guidance.

6. HEALTH HAZARD DATA:

EYE: May cause moderate eye irritation. Corneal injury is unlikely.

SKIN CONTACT: Prolonged exposure may cause skin irritation. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated skin exposure may result in absorption of harmful amounts. The LD50 for skin absorption in rabbits is >2000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 for male rats is 2589 mg/kg and for female rats is 2398 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury, swallowing amounts larger than that may cause injury. If aspirated (liquid

(Continued on page 3)

DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

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6. HEALTH HAZARD DATA: (CONTINUED)

enters the lung), may cause lung damage or even death due to chemical pneumonia.

INHALATION: Excessive exposure may cause irritation to upper respiratory tract. Signs and symptoms of excessive exposure may be central nervous system effects. The LC50 for male rats is approximately 5 mg/L and >5 mg/L for females.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may cause liver, kidney, blood, gastrointestinal, muscular and respiratory effects.

CANCER INFORMATION: Triclopyr did not cause cancer in long-term animal studies. Various animal cancer tests have shown no reliably positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative. (2,4-D)

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.

REPRODUCTIVE EFFECTS. In animal studies, triclopyr has been shown not to interfere with reproduction. Excessive dietary levels of 2,4-D caused toxic effects (weight and viability reduction) to the offspring in a rat reproduction study.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in vitro ('test tube') mutagenicity tests have been inconclusive. Results of mutagenicity tests in animals have been inconclusive.

7. FIRST AID:

EYES: Flush immediately with plenty of water. Get medical attention if irritation persists.

SKIN: Wash off in flowing water or shower. Get medical attention if irritation persists.

INGESTION: Do not induce vomiting. Call a physician or Poison Control Center.

INHALATION: Remove to fresh air if effects occur. Consult a

Continued on page 4)

Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

7. FIRST AID: (CONTINUED)

physician.

NOTE TO PHYSICIAN: The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): 3,5,6-Trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester: the Dow Industrial Hygiene Guide is 2 mg/m³ as the acid equivalent, skin. Kerosene: the Dow Industrial Hygiene Guide is 10 mg/m³. ACGIH TLV and OSHA PEL are 10 mg/m³ for 2,4-D acid.

VENTILATION: Good general ventilation should be sufficient for most conditions.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact could occur.

EYE PROTECTION: Use safety glasses. Where contact with this material is likely, chemical goggles are recommended because eye contact may cause discomfort even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: See label. Keep out of reach of children. Avoid eye or skin contact. Provide eye fountain and washing facilities near work area. Do not store near fertilizer, seeds, insecticides and fungicides. Keep away from open flame.

MSDS STATUS: Sections 6,7,8 and regsheets Revised 8/92

For information regarding state/provincial and federal regulations see the Regulatory Information Section.

(R) Indicates a Trademark Of DowElanco

DowElanco Indianapolis, IN 46268

Emergency Phone: 517-636-4400

Product Code: 01662

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Product Name: CROSSBOW (R) WEED & BRUSH KILLER

Effective Date: 08/06/92 Date Printed: 08/18/92

MSDS:001715

REGULATORY INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U.S. REGULATIONS

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

OSHA HAZARD COMMUNICATION STANDARD:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

(R) Indicates a Trademark of DowElanco
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult DowElanco For Further Information.

MONSANTO MATERIAL SAFETY DATA

MONSANTO PRODUCT NAME
ROUNDUP® HERBICIDE

MONSANTO COMPANY
800 N. LINDBERGH
ST. LOUIS, MO. 63167
EMERGENCY PH. NO. (CALL COLLECT) (314) 694-4000
DATE PREPARED: November, 1992

PRODUCT IDENTIFICATION

EPA Registration Number: 524-445
Synonyms: None
Chemical Name: Not Applicable, Formulated Product
Active Ingredient: *Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt 41.0%
Inert Ingredients: 59.0%
100.0%
*Contains 480 grams per liter or 4 pounds per gallon of the active ingredient glyphosate in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.
CAS Reg. No.: Not Applicable, Formulated Product
CAS Reg. No. Active Ingredient: 1071-83-6
DOT Proper Shipping Name: Not Applicable
DOT Hazard Class/I.D. No.: Not Applicable
DOT Label: Not Applicable
Reportable Quantity (RQ) Under CERCLA: Not Applicable
U.S. Surface Freight Classification: Weed killing compound, N.O.I.B.N.

SARA Hazard Notification

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s): Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:

This product contains, as components, the substances listed below which are identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):
Ethoxylated Tallowamines, CAS Reg. No. 61791-26-2

WARNING STATEMENTS

Keep out of reach of children.

WARNING!

CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY

HARMFUL IF INHALED.

REFORMULATION IS PROHIBITED

SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS

PRECAUTIONARY MEASURES

- Do not get in eyes or breathe spray mist or get in or on clothing.
- Wear goggles, face shield or safety glasses.
- Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.
- Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.
- Do not contaminate water when disposing of equipment washwaters.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

- If In Eyes:** Hold eyelids open and flush with plenty of water. Get medical attention.
- If Swallowed:** Drink promptly a large quantity of milk, egg whites, or gelatin solution. If these are not available, drink large quantities of water. Get medical attention.
- If Inhaled:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.
- NOTE:** For additional human emergency first aid or treatment guidance, call collect, anytime, day or night (314) 694-4000.

OCCUPATIONAL CONTROL PROCEDURES

- Eye Protection:** Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted ROUNDUP® herbicide is likely to occur.
- Skin Protection:** ROUNDUP® herbicide does not present significant skin concern requiring special protection.
- Respiratory Protection:** For Handling of the Undiluted Product: Undiluted ROUNDUP® herbicide is not likely to present an airborne exposure concern during normal handling. In the event of an accidental discharge of the material during manufacture or handling which produces a heavy vapor or mist, workers should put on respiratory protection equipment. Consult respirator manufacturer to determine appropriate type of equipment. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer.
- For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use - dilutions of ROUNDUP® herbicide.
- Ventilation:** No special precautions are recommended.
- Airborne Exposure Limits:**
- | | |
|-----------------|---|
| Product: | ROUNDUP® herbicide - 100% by wt.: |
| | OSHA PEL: None established ACGIH TLV: None established |
| | Ethoxylated Tallowamine: |
| | OSHA PEL: None established ACGIH TLV: None established |

FIRE PROTECTION INFORMATION

- Flash Point:** >200°F **Method:** Pensky-Martens
- Extinguishing Media:** Water spray, foam, dry chemical, CO₂, or any class B extinguishing agent.
- Special Firefighting Procedures:** Firefighters or others who may be exposed to vapors, mists or products of combustion should wear a self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.
- Unusual Fire and Explosion Hazards:** None

REACTIVITY DATA

- Stability:** Stable for at least 5 years under normal conditions of warehouse storage.
- Incompatibility:** Spray solutions of this product should be mixed, stored or applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined containers.
- DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.
- Hazardous Decomposition Products:** None
- Hazardous Polymerization:** Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.

HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of ROUNDUP® herbicide and development of Precautionary Statements and Occupational Control Procedures recommended in this document.

EFFECTS OF EXPOSURE

Skin contact and inhalation are expected to be the primary routes of occupational exposure to ROUNDUP® herbicide. Although limited occupational exposure to this material has not been reported to produce significant adverse health effects, ROUNDUP® herbicide is considered, on the basis of single exposure (acute) animal tests, to be slightly to moderately irritating to eyes. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.

TOXICOLOGICAL DATA

Data from laboratory studies conducted by Monsanto with ROUNDUP® herbicide are summarized below:

Single exposure (acute) studies indicate:

Oral -	Practically non-toxic, (Rat LD ₅₀ , >5,000 mg/Kg)
Dermal -	Practically non-toxic, (Rabbit LD ₅₀ , >5000 mg/Kg)
Inhalation -	Slightly toxic, (Rat 4-hr LC ₅₀ , ~2.6 mg/L)
Eye Irritation -	Slightly to moderately irritating, (Rabbit)
Skin Irritation -	Essentially non-irritating (Rabbit, 4 hr. exposure)

No skin allergy was observed in guinea pigs following repeated skin exposure.

COMPONENTS

Data from laboratory studies conducted by Monsanto and from the scientific literature on components of ROUNDUP® herbicide:

Isopropylamine Salt of Glyphosate

Data from studies with a formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight body weight changes. Following repeated skin exposure (3-week) to MON 0139, skin irritation was the primary effect in rabbits.

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice at high dose levels. Reduced body weight gain and eye changes were observed at the high dose level in one long-term (2 year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. Based on the results from the chronic studies, EPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

Nonoxylated Fatty Amine

The surfactant component of ROUNDUP® herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

PHYSICAL DATA

Appearance:	clear, viscous amber-colored solution
Odor:	practically odorless to slight amine-like odor
pH:	4.7 (1% solution)
Specific Gravity:	1.17 (Water = 1)

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

SPILL/LEAK:

Observe all protection and safety precautions when cleaning up spills -- see Occupational Control Procedures.

Liquid spills on floor or other impervious surfaces should be contained or diked, and should be absorbed with attapulgite, bentonite or other absorbent clays. Collect contaminated absorbent, place in plastic-lined metal drum and dispose of in accordance with instructions provided under DISPOSAL. Thoroughly scrub floor with a strong industrial type detergent solution and rinse with water.

Liquid spills that soak into the ground should be dug-up, placed in plastic-lined metal drums and disposed of in accordance with instructions provided under DISPOSAL.

Leaking containers should be separated from non-leakers and either the container or its contents transferred to a plastic-lined drum or other non-leaking container. Dispose of leaking container in accordance with instructions provided under DISPOSAL. Any recovered spilled liquid should be similarly collected and disposed of.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

DISPOSAL:

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.**

Metal Drums: Triple rinse container. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Metal Bulk: Triple rinse emptied bulk containers. Then offer for recycling or reconditioning or disposal in a manner approved by state and local authorities.

Plastic Drums and mini bulk: Do not reuse container. Return container per the Monsanto container return program. If not returned, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed, by state and local authorities, by burning. If burned, stay out of smoke.

DATE: November, 1992

SUPERSEDES: February, 1992

MSDS NO.: S00012114
(previously M00007588)

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CALL: 1-800-332-3111

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